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How Level Is the 'Cognitive Playing Field'? Context Shapes Alterations in Self-Conception During the Psychedelic Experience

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Abstract

In *Philosophy of Psychedelics*, Letheby provides a convincing basis for the idea that psychedelics primarily derive their therapeutic potential through mediating favourable changes to self-related belief systems. In this commentary, we take a closer look at the role that contextual factors ('set' and 'setting') play in Letheby's two-factor account of psychedelic therapy. While Letheby acknowledges that psychedelic effects are highly context-dependent, the exact role that context plays in self-modelling during the acute experience is not entirely clear. We argue that context plays an essential role in shaping the 'discovery' of alternate self-conceptions during the acute experience. Specifically, users are more likely to experience alterations in self-conception that are consistent with context-dependent features, such as one's prior mindset ('set') and aspects of the external environment ('setting'). This is consistent with a REBUS model of psychedelic effects, where a corollary effect of relaxing high-level prior beliefs is that the system becomes increasingly sensitised to bottom-up information ('prediction errors') from lower-level intrinsic sources and the sensory periphery. Furthermore, it may explain why a positive well-intentioned state of mind and a supportive therapeutic environment are more likely to result in positive acute experiences and long-term improvements in mental wellbeing. We see this position as being largely compatible with Letheby's proposal, but may shift some aspects of its emphasis and framing. In particular, it may conflict with Letheby's notion that psychedelics lead to a 'level cognitive playing field', where self-related hypotheses are thought to be assigned more or less equal probability.

Keywords

Context · Psychedelics · REBUS · Self · Set and setting

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Psychedelics are drawing world-wide attention from researchers and clinicians due to a growing appreciation for their therapeutic potential in treating a variety of mental disorders. Unlike traditional pharmacological treatments, which can take weeks or months to take effect, psychedelics have the advantage of bringing about rapid positive changes in mental wellbeing, in some cases even after a single therapeutic session (Ross et al., 2016). A key area of interest in current psychedelic research concerns their apparent ability to modulate belief-systems (McGovern et al., 2021; Timmermann et al., 2021), which are theorised to play an important role in conferring therapeutic benefits (Carhart-Harris & Friston, 2019). Under sufficiently high-doses, psychedelics tend to be accompanied by transformative 'mystical-type' experiences, which may include content of a transcendent nature, such as experiencing a cosmic consciousness, or encountering interdimensional beings or Godly entities. The induction of mystical-type experiences during a psychedelic session has been found to be an important predictor of improvements in mental health (James et al., 2020; Roseman et al., 2018). Based on these findings, some researchers have cautioned that while psychedelics may be beneficial for psychological wellbeing, they may only do so through mediating the occurrence of metaphysical beliefs in 'non-natural' entities (Lavazza, 2017). Assuming a naturalistic worldview, one may then object to psychedelic therapy since it's benefits derive from inducing a 'comforting delusion', which may make it epistemically and ethically questionable.

In his new book, the *Philosophy of Psychedelics*, Chris Letheby (2021) provides a convincing case for why this 'comforting delusion" objection is misguided. According to Letheby, psychedelics primarily exert their therapeutic benefits, not through the occurrence of non-naturalistic metaphysical beliefs, but rather through favourable changes to self-related belief systems. In terms of a therapeutic mechanism, psychedelics are proposed to loosen over-weighted pathological self-related beliefs underlying symptoms of mental illness, in turn facilitating their beneficial revision. Letheby draws on a wide range of theoretical and empirical literature to justify the therapeutic importance of changes to self-representation in psychedelic therapy. He interprets the findings to support a two-factor model of psychedelic therapeutic effect. The first factor is "the induction of plasticity at multiple levels: neural, cognitive, and phenomenological" (p. 147). This "may be sufficient for the shortterm 'afterglow' of several weeks, in which subjects report feeling lighter, freer, more energised and unburdened" (p. 147). However, for lasting changes to occur, Letheby claims that a second factor is necessary: "the discovery of new forms of self-modelling during the experience, and the consolidation of these during the subsequent period of integration" (pp. 147-148). Together, these two factors emphasise that "the cognitive plasticity of the self-model and its phenomenological manifestations are of primary therapeutic importance" (p. 143).

We find Letheby's book to be a valuable contribution to the current literature on psychedelic therapy, providing several lines of enquiry to be evaluated by fu-

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ture theoretical and empirical research. In this commentary, we take a closer look at the role that contextual influences may play in the second factor of Letheby's account. Letheby acknowledges that psychedelic effects are "strongly influenced by 'set and setting: the psychological state of the person taking the drug and the environment in which they take it' ". However, the role that contextual factors play in self-modelling during the acute psychedelic experience are not entirely clear, and seem odds with some of his claims, such as the idea that psychedelics lead to a 'level cognitive playing field' in terms of one's felt identity. We aim to show that context plays an essential role in shaping the 'discovery' of healthier forms of self-modelling during the psychedelic experience. To do this, we first outline the role of context ('set' and 'setting') in psychedelic literature. We then briefly discuss contextual influences in relation to the REBUS model (Carhart-Harris & Friston, 2019) – a predictive processing perspective which Letheby draws heavily upon in his account. Finally, we explore the implications of enhanced context-sensitivity for self-modelling and argue that there are principled differences in the kinds of alterations in self-conception that are likely to be experienced, given the brain's heightened sensitivity to context under psychedelics.

1 'Set' and 'setting' in psychedelic research

Contextual factors are widely acknowledged to exert a powerful influence on psychedelic effects. While the context-dependent nature of psychedelic effects had been appreciated long before (Hartogsohn, 2016), the importance of context was popularised through the writings of Timothy Leary in the 1960s, who introduced the terms 'set' and 'setting' to describe the non-pharmacological factors that influence the quality of a psychedelic experience (Leary et al., 1964). While definitions may slightly differ, 'set' generally refers to "the psychological factors of personality, preparation, expectation, and intention; and 'setting' refers to"the environmental factors of the physical, social and cultural surroundings in which the experience occurred" (Hartogsohn, 2016, p. 1261). Together, they are proposed to exert a central role in determining the quality of the psychedelic experience (Carhart-Harris et al., 2018; Hartogsohn, 2016; Noorani & Alderson-Day, 2020), and have been used to explain why psychedelics can promote such diverse and seemingly contradictory subjective reports (Hartogsohn, 2016). They carry a long history within psychedelic research (Hartogsohn, 2016), and remain an important consideration in modern clinical research designs (Gukasyan & Nayak, 2021). The important influence of 'set' and 'setting' is apparent in various descriptions of psychedelics in the literature. For example, psychedelics have been described as "meaning-enhancers" (Hartogsohn, 2018), "non-specific catalysts and amplifiers of the psyche" (Grof, 1994, p. 11), and "a magnifying glass to consciousness, augmenting whatever already existed in one's mind" (Leary et al., 1963; as cited by Hartogsohn, 2016, p. 1261).

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Several empirical findings support the idea that context influences the quality of the psychedelic experience and subsequent therapeutic outcomes. For example, having clear intentions and expectations is more likely to lead to a 'peak' or mystical-type experience (Carhart-Harris et al., 2018; Haijen et al., 2018) which is widely known to relate to improvements in psychological wellbeing (Carhart-Harris et al., 2018; Griffiths et al., 2016; Roseman et al., 2018; Ross, 2018). Similarly, having positive expectations is associated with "pleasant and educational experiences" (Metzner et al., 1965, p. 19), and has been found to contribute to improvements in mental health in a micro-dosing paradigm (Kaertner et al., 2021). Furthermore, having a positive set or clear intentions protects against having a challenging experience (Carhart-Harris et al., 2018). Similar findings have been found for the influence of 'setting', where taking psychedelics is more likely to lead to a 'peak experience' (Carhart-Harris et al., 2018), and "feeling comfortable in the environment of the psychedelic experience, and with the people who were present during it, had a positive effect on well-being after the experience" (Haijen et al., 2018, p. 9). On the other hand, having a negative set (Metzner et al., 1965), or taking psychedelics unknowingly or without preparation (Masters & Houston, 2000; as cited by Letheby, 2021), or taking it in an uncomfortable setting (Studerus et al., 2012) is more likely to result in adverse reactions. While challenging experiences may sometimes be viewed as therapeutically beneficial (Carbonaro et al., 2016; Gashi et al., 2021), they may also lead to less favourable outcomes for psychological wellbeing (Carhart-Harris et al., 2018; Haijen et al., 2018).

2 Predictive processing, the REBUS model, and context

In his book, Letheby draws heavily upon the predictive processing framework (Clark, 2015; Hohwy, 2013) and more specifically the REBUS model ('Relaxed Beliefs Under pSychedelics,' Carhart-Harris & Friston, 2019) of psychedelic effects. According to predictive processing, the brain can be conceptualised as a multilevel hierarchical generative model, which formulates predictions at multiple levels of abstraction and spatiotemporal scale. Levels at the bottom of this hierarchy capture relatively concrete, domain-specific features that operate over shorter spatiotemporal-scales, while levels at the top capture relatively abstract, multimodal and integrative features that operate over longer spatiotemporal-scales. Predictions are thought to be formulated at each hierarchical level in a manner akin to Bayesian inference, where incoming sensory evidence and prior beliefs are combined. The overall goal of the brain is to engage in prediction error minimisation — to minimise the difference ('prediction errors') between brain-based predictions and incoming sensory input from the world (and the body). To do this, the brain must take into account the estimated reliability or confidence ('precision') through ascribing a weighting to the prior and sensory input at each

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hierarchical level. This allows the brain to flexibly adapt to context-varying levels of noise derived from changes in the internal and external environment. Imbalances in precision-weighting have been theoretically implicated in psychiatric disorders (Sterzer et al., 2018), and are thought to occur under the influence of consciousness-altering drugs (Carhart-Harris & Friston, 2019; Corlett et al., 2016).

The REBUS model represents one such model, which aims to characterise psychedelic effects through the lens of altered precision-weighting. On this account, psychedelics exert their effects through weakening or 'relaxing' the confidence (i.e. decreasing the precision) in the brain's highest-level prior beliefs. Pharmacologically, this is thought to be brought about by the upregulation of 5-HT2A receptors, which are most densely found in high-level association regions with broad executive influence, such as the default mode network (Beliveau et al., 2017). These areas are thought to sit at the very top levels of the generative model, and thus play a strong constraining role on predictions that are made at lower levels. According to Letheby (2021, p. 119), these levels "encode our most abstract, fundamental beliefs about self and world—our bedrock, largely unconscious, domain-general assumptions concerning space, time, and causality, the laws of logic, and the existence of the self". By relaxing the influence of these high-level beliefs, psychedelics may loosen rigid pathological priors under mental illness, which provide an opportunity for their revision. Letheby draws upon this central idea to explain a number of psychedelics' well-known phenomenological effects, such as ego-dissolution, feelings of connectedness and freedom, and the increased opacity of the self-model.

However, one upshot of the REBUS model which Letheby's account may overlook is its implications for enhanced context-sensitivity. As Carhart-Harris and Friston (2019) describe in their paper, "A corollary of relaxing high-level priors or beliefs under psychedelics is that ascending prediction errors from lower levels of the system (that are ordinarily unable to update beliefs due to the top-down suppressive influence of heavily-weighted priors) can find freer register in conscious experience, by reaching and impressing on higher levels of the hierarchy" (p. 319). This "implies that the system's (context) sensitivity will be enhanced— as it will be more receptive to bottom-up information, particularly from intrinsic sources" (p. 338). This is consistent with the idea that the effects of 5HT2A receptor agonists induce cortical plasticity and "an associated sensitivity to internal (i.e. endogenous processes and pre-existing mental context) and external influence (i.e. the environment)" (Carhart-Harris et al., 2018, p. 747; see Carhart-Harris & Nutt, 2017). This enhanced sensitivity under psychedelics may be a plausible mechanism for the amplified influence of 'set' and 'setting' during the psychedelic experience. Specifically, the influence of the physical 'setting' may be explained by an increased sensitivity to prediction errors deriving from the immediate surroundings, while the influence of 'set' or mental context may reflect an increased sensitisation of

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prediction errors from lower-level intrinsic sources[1]. Wider aspects of the social and cultural 'setting' may involve some combination of these processes.

Some authors have argued that the increased influence of 'set' and 'setting' is consistent with a 'strong prior' theory (McGovern et al., 2021), where precise priors predominate over sensory input (Corlett et al., 2019). This may at first seem at odds with the REBUS model, which proposes that psychedelics primarily act to weaken high-level prior beliefs. However, this position may be compatible with the REBUS model, so long as these strong prior influences emerge at lower levels in response to the relaxed constraining influence of priors at the highest levels of the system (cf. Safron, 2020). Indeed, imbalances in precision-weighting need not be related across the inferential hierarchy in a linear way (Sterzer et al., 2018), and imbalances at certain levels can have compensatory changes in other levels or parts of the system (Corlett et al., 2019). From this perspective, the REBUS model may involve both 'strong' and 'weak' prior influences, which are present at different hierarchical levels to different degrees. The relative balance and strength of this relationship may also depend on dose-dependent changes in 5-HT2A receptor activity (Safron, 2020). Despite these underlying complexities, psychedelics can be generally characterised as weakening the constraining influence of high-level priors encoding rigid highly-abstract beliefs of the world and self, and (relatively) strengthening lower-level prior beliefs associated with context-dependent information sources. These lower-levels act as an internal information source for high-level predictions, and thus their increased prior weighting gives rise to more precise prediction errors at higher hierarchical levels. This may provide a plausible mechanism for the amplified influence of context on high-level prediction formation.

[1]Plausibly, one may question whether the prior beliefs underlying 'set' factors, such as intentions and expectations, can be considered to be implemented as a 'lower-level' intrinsic source, due to their abstract and self-related nature. However, they may still arguably differ relative to the highest-level 'bedrock' beliefs that are theorised to be the primary pharmacological target of psychedelics, which are largely unconscious, domain-general and rigid. By comparison, 'set' factors are more flexible, consciously accessible, and tend to operate over shorter timescales. If these properties are to map onto differences in hierarchical level, then it seems plausible to assume that they may be encoded at a lower level relative to the highest-level beliefs that are relaxed under psychedelics. Furthermore, 'set' factors are likely to contain predictive information that is encoded at multiple hierarchical levels, which may be differentially impacted by the pharmacological action of psychedelics. For example, a user with a positive 'set' may carry both high-level abstract self-relevant information, as well as lower-level information, for example reflecting physiological arousal and a general mood. Even if psychedelics may act to weaken the influence of certain high-level beliefs underlying 'set' factors, they may still relatively spare (or increase) the influence of information encoded at lower-levels, which may still have a marked effect on the quality of the acute experience.

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3 Context shapes alterations in self-conception under psychedelics

From the perspective of the REBUS model, psychedelics are described to flatten the prior landscape (Carhart-Harris & Friston, 2019) or, in self-modelling terms, to level the 'cognitive playing field' (Letheby, 2021) with respect to one's identity. As Letheby writes, "by reducing the brain's confidence in its assumptions about who, what, and where 'I' am, the cognitive playing field is levelled with respect to one's own identity, allowing all sorts of hypotheses to be entertained that normally would be ruled out" (p. 143). However, we believe this notion of a 'level cognitive playing field' may be potentially misleading, since it may suggest that, under psychedelics, a user may be just as likely to entertain one hypothesis regarding the self as opposed to any other. We agree that the relaxation of higher-order priors will lead to a general flattening of the prior landscape, "thereby expanding the space of phenomenologically possible worlds" (p. 121) and allowing the brain to "slide more readily between world-models" (p. 143). Nevertheless, given the system's enhanced context-sensitivity, we wish to emphasise that the resulting hypothesis-space that is experienced (in self-modelling terms, who 'I' am) is *not* random — there are principled differences in the *kinds* of hypotheses that are likely to be entertained during the psychedelic experience. Specifically, the user will be more likely to experience alterations in world and self-models that are consistent with internal and external contextual influences, due to the increased influence of prediction errors from these information-sources in revising high-level predictions.

In his book, Letheby develops a two-factor model of psychedelic therapy. For Letheby (2021), this two-factor structure is necessary because the benefits from psychedelics do not only derive from the discovery that the self is mutable—"that much of what we think is concrete and can't be escaped from are actually just ways we think" (p. 148), but also from the discovery of healthy alternate self-conceptions during the experience: "Under the influence, patients can gain new perspectives on their lives, see things differently, and access information previously filtered out or ignored. They can thereby discover new and often healthier forms of self-modelling" (p. 137). However, if psychedelics lead to a 'level cognitive playing field' in terms of one's felt identity, one may question why patients tend to experience healthy alternative self-conceptions during the acute experience as opposed to unhealthy ones. After all, there are a variety of ways in which one may conceive of the self, many of which are likely to be dysfunctional and to carry detrimental outcomes for mental health. These dysfunctional forms of self-representation should also represent viable candidates for self-modelling within a flattened prior landscape of 'phenomenologically possible worlds'.

We believe that the role of context may provide a solution to this, since it suggests that the different alternative self-conceptions that are possible are not equally likely, given the amplified influence of context on self-modelling. Un-

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der favourable contextual conditions, healthier and positive self-conceptions are preferred to unhealthy ones, because these high-level hypotheses are assigned a greater probability, given their ability to explain away precise prediction errors derived from internal and external context-dependent information sources. From this perspective, context may shape not only what is consolidated during the integration period (although this is certainly important), but also what kinds of alternative self-models are accessed or discovered during the acute experience. This is consistent with the empirical literature cited previously, where positive expectations, clear intentions, and a supportive and safe setting, are significant predictors of positive acute mystical-type experiences, as well as later improvements in psychological wellbeing. Furthermore, it may explain why patients with inadequate preparation and support may experience adverse reactions, and reduced benefits for mental health. In these instances, poor contextual conditions reduce therapeutic benefits through hindering the ability of patients to represent themselves in beneficial ways. If this is on track, then context may play an important role in facilitating the kinds of favourable self-related insights that Letheby implicates to underlie durable improvements to mental health.

4 Implications for self-related insights and epistemic benefits

By considering altered self-conception through the lens of 'set' and 'setting', one may consider alternative interpretations of some of the qualitative reports described in Letheby's book. For example, take the following subjective report in Noorani et al. (2018, p. 759) who evaluated the effects of psilocybin on attempts to quit smoking:

> It felt like I'd died as a smoker and was resurrected as a nonsmoker. Because it's my perception of myself, and that's how I felt. So I jumped up and I said 'I'm not a smoker anymore, it's all done'.

According to Letheby (2021, p. 89), cases like the above may be explained by "an increase in the felt identification with the minimal, perspective-taking self, and a concomitant decrease in felt identification with specific contents of the narrative self (the 'patterns and structures and responsibilities', such as being a 'smoker')". On this account, psychedelics may lead to a levelled cognitive playing field in terms of the felt identification of the narrative self, where the self-related hypotheses of 'smoker' and 'non-smoker' are now assigned more or less equal prior probability. This allows patients to access or 'discover' a healthier altered self-conception under psychedelics (i.e. the felt identification of a 'non-smoker'), which may then be further consolidated through an integration period after the experience. However, by considering these changes through the heightened sensitivity to context, one may say that this change in self-conception may also be driven by a relative

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increase in the felt identification of the narrative self as a 'non-smoker', as this hypothesis is congruent with contextual features, such as the therapeutic setting and the patient's underlying motivations and expectations to quit. The crucial difference from before is that the 'non-smoker' hypothesis is here assigned a higher probability relative to the 'smoker' one – they are not on a 'level cognitive playing field'. This may additionally explain why this altered self-conception is felt with relative confidence and why the addict does not spontaneously transition between the different 'smoker' and 'non-smoker' perspectives, which a flattened cognitive landscape conception may imply.

This account also has possible implications for considering the epistemic benefits that psychedelics confer. Specifically, it emphasises the role that non-pharmacological factors play in gaining new self-related knowledge or insights. We interpret the influence of 'set' to be best captured by Letheby's description of 'new knowledge of old facts', as individuals acquire the ability to represent beliefs about themselves "under a new and different mode of presentation" (Letheby, 2021, p. 85). In this way, psychedelics may promote epistemic benefits as individuals experience already existing mental contents in a novel and clinically meaningful way. This may explain the findings suggesting that the insights gained under psychedelics are in many cases "not radically 'new', but largely seen as a 'returning' or 'remembering' of something that was in some sense already known to participants" (Noorani et al., 2018, p. 759). For their fit to the present account, one may evaluate the extent to which these 'already known' insights can be traced back to consciously accessible 'set' factors that an individual has leading up to a psychedelic experience. We further speculate that reports of psychedelics may reveal "a deeper, better, or more essential self" (Noorani et al., 2018, p. 759) may reflect an increased congruence between one's sense of self-concept and the expectations and intentions that one carries for self-related change.

5 Concluding remarks

Chris Letheby's new book, the *Philosophy of Psychedelics*, provides a valuable contribution to the current literature through highlighting the primary role that changes to self-related belief systems play in promoting therapeutic benefits. Here, we have proposed that Letheby's account may be enhanced by considering the role that contextual influences play in shaping the process of discovery of alternate self-conceptions during the psychedelic experience. We see this position as being compatible with Letheby's account, but may shift some aspects of its emphasis and framing. In particular, we critique the notion that psychedelics lead to a 'level cognitive playing field', which may obscure the influence of enhanced-context sensitivity on self-modelling. Aspects of this criticism may not be specific to Letheby's account, but may also apply to the REBUS model, which also emphasises a flattened prior landscape conception of psychedelic effects. In this sense, our commentary may dovetail with other commentators who have crit-

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icised the REBUS model on the grounds that it does not pay sufficient attention to 'set' and 'setting' in its application (Noorani & Alderson-Day, 2020). We hope this commentary can supplement Letheby's existing account and provide an opening for a further clarification of his position. These and related questions can help further debates concerning the extent to which belief changes under psychedelics (and their psychological benefits) may be driven by context-dependent and context-independent mechanisms (Timmermann et al., 2021).

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